

REMARKS

In view of the above amendments and following remarks, reconsideration of the rejections that are contained in the Office Action of April 22, 2008 is respectfully requested.

Initially, the Examiner is thanked for granting and conducting the interview of July 29, 2008. The discussion during the interview will be reflected below in the discussion of the present invention and the differences between the present invention, as reflected by the claims, and the prior art that has been cited by the Examiner. However, the Examiner is thanked for the indication that a claim to a plurality of housings as making up the noise reduction apparatus would likely distinguish over the prior art. While agreement was not reached with respect to claim 17 as proposed to be amended, and as now in fact amended above, it is submitted that claim 17 defines over the cited prior art, for the reasons as will be discussed below.

Thus, as discussed during the interview, independent claim 17 has been amended to emphasize the fact that the housing, to be attached to a surface of the wall so as to face the external noise source and thereby block the noise propagation path, generates an enclosed space for noise reduction between the external noise source and the wall. In view of the further concerns of the Examiner, an additional set of claims, new claims 37-47, have been presented. These claims include new claim 46, which recites that the housing comprises a plurality of housings positioned on the surface of the wall so as to face the external noise source in accordance with the suggestion of the Examiner.

Turning to the Office Action, the Examiner had rejected claim 17 as being anticipated by Clark, Jr. et al., U.S. Patent 5,848,169 (Clark). Further, the Examiner rejected claims 19-26 as being unpatentable over Clark in view of Fuller et al., U.S. Patent 5,692,053 (Fuller). However, it is respectfully submitted that all of the claims that are pending in the present application, particularly as now amended and presented, clearly distinguish over Clark and Fuller.

As described in the present specification for example with respect to the embodiment of Figs. 16 and 17, the noise reduction apparatus is provided for reducing noise that is propagated toward a predetermined space on one side of a wall from an external noise source on another side of the wall. The apparatus can include a housing 21 (and a plurality of housings 21 are illustrated in Fig. 17) that

is to be attached to the wall 22 so as to face the external noise source and thereby block the noise propagation path toward the wall. See also for example Fig. 1 which illustrates the basic point of the positioning. The housing 21 is attached to the surface of the wall so as to generate an enclosed space for noise reduction between the external noise source and the wall. The loudspeaker 1a, and in the embodiment as illustrated for example by Fig. 16, four loudspeakers 1a-1d, is attached to the housing so as to face the external noise source so as to block the noise propagation path. The loudspeaker radiates sound into the enclosed space, including the sound from the external noise source. A sound detector 2 is placed within the enclosed space for detecting the sound that is propagated from the external noise source through the loudspeaker. A control arrangement 3 causes the loudspeaker to radiate sound so as to minimize the sound that is detected by the sound detector based on a result corresponding to the sound that is detected by the sound detector.

Independent claim 17, as noted above, reflects this structure. The claim has been amended to emphasize that the housing generates the enclosed space for noise reduction between the external noise source and the wall. The housing is already required to be positioned so as to block the noise propagation path, it is noted. The loudspeaker, further, is also required to block the noise propagation path, and thus the loudspeaker radiates the sound propagated from the external noise source into the enclosed space.

Thus, according to the structure of claim 17, the noise and the control sound are radiated from the loudspeaker, i.e. propagated into the enclosed space through the diaphragm of the same loudspeaker. Thus the wave front of the noise is coincided with that of the control sound, making it possible to reduce the noise over a wide area.

In the final Office Action, the Examiner cites Clark as anticipating claim 17. In particular, the Examiner cites Clark as having a loudspeaker (112, 150) to be attached to the housing so as to face the external noise source and thereby block the noise propagation path for radiating sound into the enclosed space. However, this is clearly not the case in Clark.

Fig. 7 of Clark, in fact, represents an experimental enclosure where a loudspeaker 150 is placed at one end as the disturbance loudspeaker. See the discussion in Clark in the paragraph beginning at line 22 of column 6. Thus, the loudspeaker, 150 is the external noise source. Acoustic

loudspeaker 112 is mounted at the other end of the enclosure 5, and is used as a control loudspeaker to control the acoustic response of the enclosure 5. Thus it is clear that in Clark, the loudspeaker 112 is not attached to the housing so as to face the external noise source. Rather, the positioning is so as to face across the enclosure 5.

It becomes clear that the experimental enclosure of Clark that is illustrated in Fig. 7 is based on a different operating idea than that of the present invention. The housing is not disclosed as attached to a wall so as to face an external noise source. The loudspeaker 112 is not attached to the housing so as to face the external noise source. The external noise is not propagated through the loudspeaker 112, but propagated from a loudspeaker 150 at an opposite end of the enclosure 5. The sound detector in Clark, microphone 110, does not detect sound that is propagated from the external noise source through the loudspeaker.

In Clark, the invention is directed to the context of reverberant sound fields with the control system placed in a corner of a reverberant enclosure at the position of maximum response to the acoustic modes. As described in the paragraph beginning at line 43 of column 3, microphone 110 and the loudspeaker 112 are placed within an enclosure 5 effectively collocated from the perspective of the longer wavelengths of lower frequency sound. As noted in the last paragraph of column 3, they should be positioned in the corner of the enclosure 5 to enable coupling to all of the low-frequency acoustic modes of the reverberant sound field.

However, the basis of the noise reduction apparatus according to the present invention is to locate the loudspeaker on the housing so as to face the external noise source and block the noise propagation path. Thus it is clear that the invention of Clark and the present invention are operating based on distinct concepts, resulting in the differently claimed and disclosed structure. The loudspeaker 112 in Clark is not positioned so that the external noise is propagated into the generated enclosed space through the loudspeaker 112. Thus, it is submitted, claim 17 clearly distinguishes over Clark.

In the Office Action, the Examiner stated that the sound detector 110 is placed within the closed space for detecting sound propagated from the external noise source through the loudspeaker. However, there is no external noise source that generates noise that is propagated through the

loudspeaker 112. The loudspeaker 150 is the source of noise in the experimental enclosure of Fig. 7 of Clark.

During the interview, the Examiner indicated that he believed that some external noise would be propagated through the loudspeaker 112 into the enclosure 5. However, it is respectfully submitted that this ignores the actual teachings of what the Clark reference says about how noise is generated. Fig. 7 of Clark is an experimental enclosure. There is nothing within the remainder of the Clark patent to indicate that the positioning of the loudspeaker that is used as a control would ever be positioned so as to face the external noise source so as to block the noise propagation path. The present invention is clearly directed to a source of noise having a particular direction, as reflected in both the preamble and the various paragraph limitations of claim 17. The limitation should be considered in that context, and it is submitted that it is improper to attempt to meet the limitations of the claim by reference to some ambient, general or trace noise. In any case, the Examiner's position on this issue is not quite clear, and should the Examiner continue to reject claim 17, the Examiner is respectfully requested to indicate how this limitation is met with specificity.

New independent claim 37 has been presented so as to attempt to address some of the Examiner's concerns as raised during the interview. Thus, this claim is similar to claim 17, but uses more active or direct phrasing in referring to the positioning of the housing on the surface of the wall to face the external noise source. In particular, the housing is recited as comprising the wall side that is positioned against the other side of the wall and the noise propagation side that is positioned facing the external noise source. Clearly, Clark has no such wall side of the enclosure 5 and noise propagation side facing an external noise source.

Dependent claim 46 has been added to recite that the at least one housing of claim 37 comprises a plurality of houses positioned on the surface of the wall so as to face the external noise source. As the Examiner noted during the interview, such is clearly not found in Clark.

The Examiner further cited the patent to Fuller for a number of the limitations of the dependent claims. However, these do not need to be specifically addressed at this point given the clear difference with Clark as explained above. In any case, it is readily seen that Fuller does not cure the deficiencies of Clark.

In view of the above it is respectfully submitted that all of the claims which are now pending in the present application clearly patentably distinguish over the prior art that has been cited by the Examiner. Indication of such is according requested.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance, and the Examiner is requested to pass the case to issue. If the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact Applicants' undersigned representative.

Respectfully submitted,

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